

Borehole

30-00-01**Log Event A****Borehole Information**

Farm : <u>C</u>	Tank : <u>C-106</u>	Site Number : <u>299-E27-56</u>
N-Coord : <u>42,954</u>	W-Coord : <u>48,191</u>	TOC Elevation : <u>645.17</u>
Water Level, ft :	Date Drilled : <u>12/27/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.313</u>	ID, in. : <u>8</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>145</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.500</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>45</u>	

Cement Bottom, ft. : 145 Cement Top, ft. : 143

Borehole Notes:

This borehole was drilled in December 1944 to a depth of 145 ft. The borehole was started with a 45-ft length of permanent 12-in. surface casing and was completed to a nominal depth of 145 ft using 8-in. casing. According to the drilling log, the 8-in. casing was perforated from 43 to 143 ft and the bottom of the 8-in. casing was sealed with half a sack of cement. The drilling log does not indicate if the annulus between the 8-in. and 12-in. casings was grouted. The thickness of the 8-in. casing is presumed to be 0.313 in.; the thickness of the 12-in. casing is presumed to be 0.500 in. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the ground surface.

The current total depth of the borehole was measured at 68.1 ft below the top of the casing using a weighted tape, although this borehole was drilled to a total depth of 145 ft in 1944. The total depths of historical gross-gamma log runs have become progressively shallower over time, indicating that the casing perforation have allowed loose sand to infiltrate into and slowly fill the borehole, or sand and silt has entered the borehole from the surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1996</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>04/14/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>67.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>29.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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30-00-01**Log Event A**

Log Run Number :	<u>2</u>	Log Run Date :	<u>04/15/1997</u>	Logging Engineer:	<u>Bob Spatz</u>
Start Depth, ft.:	<u>31.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>0.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : E. LarsenData Processing Reference : P-GJPO-1787Analysis Date : 05/16/1997

Analysis Notes :

This borehole was logged by the SGLS in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.322-in.-thick steel casing were applied during analysis. The combined casing thickness along the double-cased interval of the borehole is known to be greater than 0.322 in. Consequently, the calculated concentrations within this region is underestimated.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured continuously from the ground surface to 20.5 ft, intermittently from 21.5 to 44.5 ft, and continuously from 45.5 ft to the bottom of the logged interval (67.5 ft). Co-60 contamination was detected intermittently from 58.5 ft to the bottom of the logged interval.

It was not possible to identify many of the 609-keV peaks used to derive the U-238 concentrations near the ground surface and below the double-cased interval of the borehole. This occurred because high gamma-ray activity associated with the nearby Cs-137 peak (661 keV) created an elevated Compton continuum extending to the 609-keV region, causing the MDL to exceed the measured U-238 concentration.

The 609-, 1460-, and 2614-keV gamma-ray energies have been attenuated along the double-cased interval of the borehole, resulting in reduced U-238, K-40, and Th-232 concentration values, respectively. As a result, many of the 609-keV and some of the 2614-keV gamma-ray peaks in this region were not detected by the SGLS because the U-238 and Th-232 activities were reduced below the detection limit by casing attenuation.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks C-102 and C-106.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence



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intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.